

What is claimed is:

1. A bearing assembly comprising at least one foil bearing including at least one foil member positioned to face a rotor portion for relative rotational movement there between for bearing the rotor and at least one resilient member for resiliently supporting said foil member, at least one magnetic bearing, a controller, means for sensing actual load on at least one of said foil and magnetic bearings, and means for inputting the sensed actual load to said controller for sharing load between said foil and magnetic bearings.

2. A bearing assembly according to claim 1 wherein said actual load sensing means comprises at least one strain gage attached to said resilient member.

3. A bearing assembly according to claim 1 wherein said actual load sensing means comprises at least one plurality of temperature sensors spaced circumferentially of said foil bearing.

4. A bearing assembly according to claim 1 wherein said actual load sensing means comprises at least one flux sensor for sensing flux of said magnetic bearing.

5. A bearing assembly according to claim 1 further comprising at least one accelerometer and means for inputting values of acceleration of the bearing assembly to the controller for use in control of the bearing assembly.

6. A bearing assembly according to claim 1 wherein the bearing assembly is a journal bearing assembly.

7. A bearing assembly according to claim 1 wherein the

bearing assembly is a thrust bearing assembly.

8. A bearing assembly according to claim 1 further comprising a housing for receiving said rotor for relative rotational movement there between and which at least partially houses said magnetic bearing, wherein said magnetic bearing includes at least one first control coil for regulating magnetic interaction with the rotor on a first side axially of said housing, at least one second control coil for regulating magnetic interaction with the rotor on a second side axially of said housing, at least one first sensor for sensing radial position of the rotor on said first side of said housing, at least one second sensor for sensing radial position of the rotor on said second side of said housing, means responsive to input of rotor radial position from said first sensor for outputting a signal to said first control coil for regulating amount of flux on said first side of said housing, and means responsive to input of rotor radial position from said second sensor for outputting a signal to said second control coil for regulating amount of flux on said second side of said housing.

9. A method for bearing a rotor comprising effecting sharing of rotor load between a foil bearing and a magnetic bearing, said load-sharing step including sensing actual load on at least one of the foil bearing and the magnetic bearing and inputting the sensed actual load to a controller for effecting the load sharing.

10. A method according to claim 9 wherein the step of sensing actual load comprises sensing strain on the foil bearing.

11. A method according to claim 9 wherein the step of sensing actual load comprises sensing temperature at a

plurality of locations spaced circumferentially of the foil bearing.

12. A method according to claim 9 wherein the step of sensing actual load comprises sensing flux of the magnetic bearing.

13. A method according to claim 9 further comprising inputting values of acceleration of the bearings to the controller.

14. A method according to claim 9 wherein the bearings constitute a journal bearing assembly.

15. A method according to claim 9 wherein the bearings constitute a thrust bearing assembly.

16. A method according to claim 9 further comprising outputting, in response to input of radial position of a rotor portion from a first sensor on a first side of a housing for the magnetic bearing part, a signal to a first control coil for regulating amount of flux on the first side of the housing and further comprises outputting, in response to input of rotor portion radial position from a second sensor on a second side of the housing, a signal to a second control coil for regulating amount of flux on the second side of the housing.

17. Bearing apparatus comprising a housing for receiving a rotor for relative rotational movement there between, a magnetic bearing assembly on said housing for magnetically interacting with the rotor for bearing the rotor, said magnetic bearing assembly including at least one first control coil for regulating magnetic interaction with the rotor on a first side axially of said housing, at least one second control coil for regulating magnetic interaction with the

rotor on a second side axially of said housing, at least one first sensor for sensing radial position of the rotor on said first side of said housing, at least one second sensor for sensing radial position of the rotor on said second side of said housing, means responsive to input of rotor radial position from said first sensor for outputting a signal to said first control coil for regulating amount of flux on said first side of said housing, and means responsive to input of rotor radial position from said second sensor for outputting a signal to said second control coil for regulating amount of flux on said second side of said housing.

18. Bearing apparatus according to claim 17 further comprising a single bias coil for supplying bias current for magnetic interaction of said magnetic bearing assembly with the rotor on both of said first and second sides of said housing.

19. Bearing apparatus according to claim 17 further comprising a comparator, means for generating from data from said second sensor a signal that simulates motion of the rotor on said first side of said housing and for outputting said generated signal to said comparator, said comparator adapted for comparing said generated signal with actual data from said first sensor and for sending said data from said first sensor to said first control coil for regulating amount of flux on said first side of said housing if said comparison indicates that said first sensor is operating properly and for sending said generated signal to said first control coil for regulating amount of flux on said first side of said housing if said comparison indicates that said first sensor is not operating properly.

20. A method for regulating a magnetic bearing part comprising outputting, in response to input of radial position

of a rotor portion from a first sensor on a first side of a housing for the magnetic bearing part, a signal to a first control coil for regulating amount of flux on the first side of the housing and further comprises outputting, in response to input of rotor portion radial position from a second sensor on a second side of the housing, a signal to a second control coil for regulating amount of flux on the second side of the housing.

21. A method according to claim 20 further comprising supplying bias current from a single bias coil for magnetic interaction of said magnetic bearing assembly with the rotor on both of said first and second sides of said housing.

22. A method according to claim 20 further comprising generating from data from the second sensor a signal that simulates motion of the rotor portion on the first side of the housing, comparing said generated signal with actual data from the first sensor, sending the data from the first sensor to the first control coil for regulating amount of flux on the first side of the housing if the comparison indicates that the first sensor is operating properly and for sending the generated signal to the first control coil for regulating amount of flux on the first side of the housing if the comparison indicates that the first sensor is not operating properly.